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EXAMINER

GABEL, GAIENE

ART UNIT

PAPER NUMBER

1641

26

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Please find below and/or attached an Office communication concerning this application or proceeding.

Advisory Action

Application No.

09/177,814

Applicant(s)

GILTON, TERRY L.

Examiner

Gailene R. Gabel

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--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 20 March 2003 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE. Therefore, further action by the applicant is required to avoid abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

PERIOD FOR REPLY [check either a) or b)]

- a) ☒ The period for reply expires 6 months from the mailing date of the final rejection.
- b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection. ONLY CHECK THIS BOX WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

1. ☐ A Notice of Appeal was filed on _____. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.
2. ☐ The proposed amendment(s) will not be entered because:
- (a) ☐ they raise new issues that would require further consideration and/or search (see NOTE below);
- (b) ☐ they raise the issue of new matter (see Note below);
- (c) ☐ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
- (d) ☐ they present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: _____.

3. ☐ Applicant's reply has overcome the following rejection(s): _____.
4. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
5. ☒ The a) ☐ affidavit, b) ☐ exhibit, or c) ☒ request for reconsideration has been considered but does NOT place the application in condition for allowance because: see attached.
6. ☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.
7. ☒ For purposes of Appeal, the proposed amendment(s) a) ☐ will not be entered or b) ☒ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: NONE.Claim(s) objected to: NONE.Claim(s) rejected: 1,3-11,13-44,46,48-64,66-74 and 105-107.Claim(s) withdrawn from consideration: NONE.

8. ☐ The proposed drawing correction filed on _____ is a) ☐ approved or b) ☐ disapproved by the Examiner.
9. ☐ Note the attached Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____.
10. ☐ Other: _____

Advisory Action

1. Applicant's response filed 3/20/03 in Paper No. 25 is acknowledged. Currently, claims 1, 3-11, 13-44, 46, 48-64, 66-74 and 105-107 are pending and are under examination.

Claim Rejections - 35 USC § 102/103

2. Claims 1, 3-5, 7, 9-11, 13, 16, 18-20, 25, 29-32, 34, 38-39, 43, 46, 48-53, 56, 64, 69-71, and 73 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Isaka et al. (US 5,482,598) in view of Overton et al. (US 5,611,846).

3. Claims 8, 26-28, 35-37, and 66-68 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Isaka et al. (US 5,482,598) in view of Overton et al. (US 5,611,846) as applied to claims 1, 3-5, 7, 9-11, 13, 16, 18-20, 25, 29-32, 34, 38-39, 43, 46, 48-53, 56, 64, 69-71, and 73 above, in further view of Swedberg et al. (US 5,571,410).

4. Claims 14-15, 17, 21, 40-41, 44, and 54-55 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Isaka et al. (US 5,482,598) in view of Overton et al. (US 5,611,846) as applied to claims 1, 3-5, 7, 9-11, 13, 16, 18-20, 25, 29-32, 34, 38-39, 43, 46, 48-53, 56, 64, 69-71, and 73 above, and further in view of Miura et al. (US 5,132,012).

5. Claims 22-24, and 42 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Isaka et al. (US 5,482,598) in view of Overton et al. (US 5,611,846)

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as applied to claims 1, 3-5, 7, 9-11, 13, 16, 18-20, 25, 29-32, 34, 38-39, 43, 46, 48-53, 56, 64, 69-71, and 73 above, and further in view of Northrup et al. (US 5,882,496).

6. Claims 6, 57-62, and 72 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Isaka et al. (US 5,482,598) in view of Overton et al. (US 5,611,846) as applied to claims 1, 3-5, 7, 9-11, 13, 16, 18-20, 25, 29-32, 34, 38-39, 43, 46, 48-53, 56, 64, 69-71, and 73, in further view of Northrup et al. (US 5,882,496) and Sunzeri (US 5,536,382).

7. Claim 105 stands rejected under 35 U.S.C. 102(e) as being anticipated by Thakur (US 6,225,159).

8. Claim 105-107 stands rejected under 35 U.S.C. 102(e) as being anticipated by Thakur et al. (US 6,126,847).

9. Claims 33, 63, and 74 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Isaka et al. (US 5,482,598) in view of Overton et al. (US 5,611,846) as applied to claims 1, 3-5, 7, 9-11, 13, 16, 18-20, 25, 29-32, 34, 38-39, 43, 46, 48-53, 56, 64, 69-71, and 73 above, further in view of Northrup et al. (US 5,882,496), and in further view of Crenshaw et al. (US 5,726,085).

Response to Arguments

10. Applicant's arguments filed 3/20/03 have been fully considered but they are not persuasive.

A) Applicant argues that the combination of Isaka and Overton does not suggest all the limitations of independent claims 1, 30, 51, and 64; rather Overton teaches away

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from the claimed invention because the teaching of Overton is limited to a conventional tubular gas chromatography that includes a plurality of tubular columns which are indirectly interconnected with other tubular columns to facilitate the selection of a column through which a sample is conveyed. Applicant contends that the Office's reliance on Overton is improper because it teaches nonanalogous art.

In response, the rejection of claims 1, 3-5, 7, 9-11, 13, 16, 18-20, 25, 29-32, 34, 38-39, 43, 46, 48-53, 56, 64, 69-71, and 73 is based on an obvious combination of the teachings of Isaka and Overton wherein Isaka was cited the teaching of a column chromatograph that includes a single porous silicon column formed on a semiconductor substrate which comprises of silicon. Overton was cited only for his teaching and use of multiple column fabrication in miniaturized column chromatographs to facilitate provision of individual sampling conveyor system. It would have been obvious to one of ordinary skill in the art at the time of the instant invention to incorporate multiple separation columns as taught by Overton into the miniaturized chromatograph apparatus of Isaka because Overton specifically taught multiple columns in various configurations for different intended applications suggesting that fabrication and use of multiple columns in separation chromatographs is well within ordinary skill. It has also been held that mere duplication of the essential working parts, in this case, duplication of separation columns in a column chromatograph, involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.* 193 USPQ 8. Further, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or

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all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art, given what is currently known in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

B) Applicant argues that Isaka and Overton, while drawn to miniaturized apparatus that are configured to separate one or more constituents from the remainder of the sample, both pertain to completely different fields of art, because Isaka is drawn to extremely small separation apparatus and are formed in silicon whereas the teaching of Overton is directed to separation apparatus that employ miniaturized conventional tubular columns. Therefore, there would not have been no motivation for one of ordinary skill to combine the teachings of Isaka and Overton.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). To reiterate, Isaka was cited for the teaching of a column chromatograph that includes a single porous silicon column formed on a semiconductor substrate which comprises of silicon. Overton was cited only for his teaching and use of multiple column fabrication in miniaturized column chromatographs to facilitate provision of individual sampling conveyor system. It would have been obvious to one of ordinary skill in the art at the time of the instant invention to incorporate multiple separation columns as taught by Overton into the miniaturized chromatograph apparatus of Isaka because Overton

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specifically taught multiple columns in various configurations for different intended applications suggesting that fabrication and use of multiple columns in separation chromatographs is well within ordinary skill. It has also been held that mere duplication of the essential working parts, in this case, duplication of separation columns in a column chromatograph, involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.* 193 USPQ 8. Additionally, one of ordinary skill in the art at the time of the instant invention would have been motivated to incorporate two porous regions or columns or otherwise, multiple columns such as taught by Overton into the apparatus of Isaka, because multiplicity in columns facilitate multiple and simultaneous sampling into a separation chromatograph; thus allowing for side by side comparison of results between sample and control or between individual samples.

C) Applicant argues that one of ordinary skill in the art at the time of the instant invention would have no reason to expect that a combination of the teachings of Isaka and Overton would have been successful; the resulting apparatus would include a single porous column which is formed in a silicon substrate and an assembly of miniaturized conventional tubular columns and valves.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). To reiterate, Isaka was cited the teaching of a column chromatograph that includes a

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single porous silicon column formed on a semiconductor substrate which comprises of silicon. Overton was cited only for his teaching and use of multiple column fabrication in miniaturized column chromatographs to facilitate provision of individual sampling conveyor system. Additionally, mere duplication of the essential working parts, in this case, duplication of separation columns in a column chromatograph, involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.* 193 USPQ 8.

D) Applicant argues that the multiple interconnected columns of Overton teaches away from the teaching of Isaka, Sunzeri, and Northrup because it does not allow separate columns for control and sample of the type taught by Sunzeri and differs from the separate unconnected columns in the electrophoretic device of Northrup. Applicant further contends that Isaka and Northrup are drawn to separation apparatus formed from silicon which is a different field of art from the teaching of Overton and Sunzeri which employ conventional tubular columns.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In this case, Northrup was combined with the teaching of Isaka and Overton only for the teaching of electrodes within or adjacent porous membranes which are used to control flow of electrically charge biochemical species such as in electrophoresis, i.e. negative electrode is formed at one end (inlet) of a column and a positive electrode is formed is

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formed at an opposite end of a column, thereby forming microelectrophoresis channels. Sunzeri was further combined thereafter for the teaching of incorporating internal or external standards into a column chromatographs. Thus, it would have been obvious to one of ordinary skill in the art at the time of the instant invention to incorporate internal standards or controls as taught by Sunzeri and migration facilitator as taught by Northrup, into the miniaturized chromatographic device taught by Isaka as modified by Overton and Northrup, because use of internal controls or standards in column chromatographic devices such as taught by Sunzeri, and microelectrophoretic control of the flow of electrical charge species, in porous membranes, are conventional and standard in laboratory practice to those well within ordinary skill. Further, contrary to Applicant's argument, Northrup, does provide a suggestion to fabricate multiple microchannels in a chromatographic device, if desired.

E) Applicant argues that Thakur '159 does not anticipate the teaching of the claimed invention because it fails to expressly or inherently describe a flow inlet connected to a flow channel as recited in claim 105-107.

In response to Applicant's argument that Thakur '159 's trench capacitor is not a "flow channel" and does not have a flow inlet, it is noted that Thakur '159 discloses an elongate trench, i.e. a flow channel, that is formed from hemispherical grained silicon in the trench capacitor; thus, as recited, Thakur '159 anticipates the claimed invention.

F) Applicant argues that Thakur '847 does not anticipate the teaching of the claimed invention because it fails to expressly or inherently describe a flow inlet connected to a flow channel as recited in claim 105-107 but rather describes a container structure that is an open topped structure on wall of HSG.

In response to Applicant's argument that Thakur '847 's container structure is an open topped structure on wall of HSG, it is not a "flow channel", and does not have a flow inlet, it is noted that Thakur '847 discloses an elongate trench on a surface of a substrate which includes silicon oxide and wherein HSG is selectively etched and formed thereon, i.e. a flow channel; thus, as recited, Thakur '847 anticipates the claimed invention.

G) Applicant argues that the combination of Crenshaw with Isaka, Overton, and Northrup would not have suggested the claimed invention and the addition of Crenshaw fails to cure the deficiencies of the combined teaching of Isaka, Overton, and Northrup because Crenshaw does not teach analogous art.

In response, Crenshaw is incorporated with the combined teaching of Isaka, Overton, and Northrup only for the teaching of porous silicon matrix comprising hemispherical grained silicon (HSG). It would have been obvious to one of ordinary skill in the art at the time of the instant invention to substitute the porous silicon matrix disclosed by Isaka or Northrup as modified by Overton, with HSG as taught by Crenshaw because Crenshaw specifically taught that HSG is used to increase surface area in trench capacitors and Northrup specifically taught that porosity in silicon

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structures increases surface area in miniaturized separation flow channels such as in his electrophoresis device or the microchannel separation device disclosed by Isaka so that HSG appears to constitute an obvious variation of porous silicon used in separation devices.

11. For reasons aforementioned, no claims are allowed.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gailene R. Gabel whose telephone number is (703) 305-0807. The examiner can normally be reached on Monday to Thursday from 7:00 AM to 4:30 PM. The examiner can also be reached on alternate Fridays from 7:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le, can be reached on (703) 305-3399. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-4242.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

Gailene R. Gabel
Patent Examiner
Art Unit 1641

8/23/03

Christopher L. Chin

CHRISTOPHER L. CHIN
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4/4/03